



IMPACT OF COVID 19 ON PERIPHERAL VASCULAR DISEASE AND ITS INCREASED INCIDENCE ON LOWER LIMB AMPUTATION-A RETROSPECTIVE STUDY

Surgery

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ABSTRACT

Background :Due to disruptions in the regular delivery of healthcare, the COVID-19 pandemic has had an indirect and detrimental impact on patient health. This is especially valid for those suffering from long-term ailments such peripheral vascular disease (PVD).This study evaluates the rates of amputation and amputation indications during the pre-pandemic and pandemic periods in an effort to assess the pandemics effects on PVD patients .**Methods:**Lower extremity amputation data collected from the previous records from the year 2017-2019 and from 2020-2022 at tertiary care hospital .**Results:**The number of total amputations increased from 200 pre- pandemic to 260 during pandemic .Amputations due to tissue loss secondary to arterial insufficiency increased from 70 to 90, a 28% increase, potentially indicating disruptions to revascularization procedures contributing to the rise in amputations.**Conclusion:**According to this study, there were more amputations overall and more major amputations during the pandemic than there had been before. A growing number of amputations in the pandemic group were due to tissue loss as a result of arterial insufficiency, suggesting that revascularization disruption was probably a factor in this rise in amputations.

KEYWORDS

amputation, COVID-19, pandemic,major amputation,Peripheral vascular disease

INTRODUCTION:

After being discovered for the first time in China in 2019, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) quickly spread over the globe and resulted in the COVID-19 pandemic in 2020. Governments all throughout the world used a variety of infection control measures, including lockdowns, closures of businesses, schools, and colleges, as well as travel restrictions, in an attempt to prevent the virus's spread as it proceeded to spread and claim millions of lives. Healthcare systems were soon overloaded with a huge number of COVID-19 patients who were really ill. A number of initiatives were implemented to reroute the medical staff in response to the surge in demand for COVID-19- related care. Consequently, numerous routine outpatient follow-up sessions were postponed or cancelled, and elective procedures were canceled.This disturbance affects patients with peripheral vascular disease (PVD) who need limb salvage treatments. Following COVID- 19 , management of PAD, a prevalent, complex, chronic illness with a broad spectrum of severity, has deteriorated, leading to a rise in mortality and amputation rates. When PAD is accompanied by lower limb ulcers that have persisted for longer than two weeks, gangrene, or lower limb rest pain, it is referred to be chronic limb-threatening ischemia (CLTI).Furthermore, individuals with uncontrolled diabetes have a higher likelihood of developing ischemic vascular alterations, which hasten the course of the disease and raises the chance of amputation.

MATERIALS AND METHODS:

This is a retrospective single centered study conducted in the department of general surgery at Kanyakumari government medical college.The data has been collected from the previous records of year 2017 -2019 which is the pre pandemic era and 2020-2022.i.e pandemic era .Included were amputations brought on by infection, ulcerations (both arterial and non-arterial), acute ischaemia, and rest pain—pain felt in the feet at rest because of arterial insufficiency, which suggests a chronic ischaemia that could jeopardise limbs.Patients characteristics, indications for admission, and surgical features were analysed. The occurrence of 30 day outcomes was assessed, including length of stay, rates of major adverse cardiovascular events and major adverse limb events and procedural and hemodynamic status.

Statistical Analysis

IBM SPSS Statistics version 29.0 was used for the statistical analysis .For continuous variables, descriptive data were shown as mean ± standard deviation (SD), and for categorical variables, as value and percentage.

Inclusion Criteria :

Patients with diabetes mellitus .

Patients with peripheral vascular disease .

Patients who underwent below or above knee amputation due to diabetes or peripheral vascular disease . Patients with acute limb ischemia

Exclusion Criteria :

Patients who underwent lower limb amputations due to other causes such as trauma

RESULTS:

The mean age and distribution of genders were same in the both Pre pandemic and pandemic groups .Diabetes and ischemic heart disease (IHD) co-morbidities affected most patients in both groups(Table 1)

The total number of amputations increased from 200 in the pre-pandemic group to 260 in the pandemic group, a 30%increase .Above knee amputations increased from 20 to 30 ,a 50%increase.similarly below knee amputations increased from 180 to 230 ,a 27% increase .The % of below knee amputations was higher than above knee amputations in both the Pre pandemic and pandemic periods (Table 2) In terms of indications of surgery ,the number of amputations done due to infection,non arterial ulcer,rest pain were similar in both groups .however amputations due to tissue loss secondary to arterial insufficiency increased from 70 to 90 ,a 28% increase during the pandemic (Table 3)

Table 1:patient demographics

	Prepandemic	Pandemic
AGE (mean±SD in years)	67±13.6	68±13.4
MALES	150(75%)	190(73.1%)
FEMALES	50(25%)	70(26.9%)
DIABETES	168(84%)	210(80.7%)
IHD	110(55%)	130(50%)

Table 2:No of amputations in prepandemic and pandemic groups

	Prepandemic	Pandemic	%change
Total amputations	200	260	30%
LEVEL OF AMPUTATION			
Above knee	20((10%)	30(11.5%)	50%
Below knee	180(90%)	230(88.4%)	27%

Table 3:Indications of amputations inpre-pandemic and pandemic groups

Indication	Pre pandemic	Pandemic	%change
Infection	70(35%)	85(32.6%)	21%

Acute ischemia	30(15%)	40(15.3%)	33%
Non arterial ulcer	20(10%)	30(11.5%)	50%
Arterial ulcer/ gangrene	70(35%)	90(34.6%)	28%
Rest pain	10(5%)	15(5.76%)	50%

DISCUSSION:

The COVID-19 pandemic has caused significant disruptions to the usual delivery of healthcare, which have had a detrimental effect on patient health. Due to infection control measures like lockdowns, many patients with chronic illnesses were unable to attend their scheduled follow-up appointments, and many others postponed or avoided visiting the hospital when their symptoms suddenly worsened out of fear of getting COVID-19. Although health inequities have long existed, the COVID-19 pandemic brought them to the forefront of our collective consciousness, with preventive care and chronic disease management neglected due to surges in infection rates and stay-at-home orders, the pandemic also unveiled and exacerbated existing disparities in health care delivery and outcomes across the United States. Chronically disenfranchised and vulnerable populations have fared worse with both COVID-19-related illness and sequelae and non-COVID-19-related health outcomes. This is likely a result of the compounding effect the pandemic has had on chronic disease and social determinants of health. The cancellation of planned elective surgeries significantly impacted patients with PVD and probably postponed necessary limb salvage and revascularization procedures. In the current study, we compared the lower limb amputation rates during the pandemic period to pre-pandemic timeframes in order to examine the indirect effects of the COVID-19 pandemic on patients with PVD. A higher number of amputations was seen during the pandemic.

According to guidelines published by the European Society of Cardiology, the European Society for Vascular Surgery, and the European Society for Vascular Medicine, chronic PAD is defined as the presence of partial or total blockage of one or more lower limb arteries in conjunction with an ankle-brachial index (ABI) of 0.9, or a toe-brachial index (TBI) of 0.7 in the event that a high ABI (1.40) due to medial calcification is present. An abrupt decrease in limb arterial perfusion that poses a hazard to limb viability is known as acute limb ischemia (ALI). A post-operative increase of >0.1 of TBI or >0.1 of ABI, as well as the patency of the treated segment, were considered indicators of hemodynamic success. Reintervention on the revascularized segment or a secondary major amputation of the revascularized limb were examples of major adverse limb events (MALE). Cardiovascular mortality, myocardial infarction, and cerebrovascular accident were all taken into consideration. Nearly all chronic medical conditions are risk factors for worse COVID-19 illness and are more prevalent in racial and ethnic minority populations, as well as socioeconomically disadvantaged populations. These populations are more likely to be employed as essential workers, are less able to work remotely and socially isolate, and are more likely to live in densely populated areas with more crowded living conditions. Those living in rural areas have reduced access to testing and care, which can lead to delays in presentation with more severe illness. Lack of representation and implicit biases among health care workers also creates a barrier of stigma and substandard care of racial and ethnic minority populations.

The inability to differentiate between amputations resulting from PVD alone and those resulting from diabetes progression is another drawback of our study. It is important to note that a large number of the research we have included for comparison primarily address amputations related to complications from diabetic foot disease. We thought it reasonable to compare our study findings with others that solely focused on diabetic foot-related amputations because a considerable majority of our study population had a diagnosis of diabetes and coexistence of diabetes and PVD is often common. However, it is imperative that we identify and accept this significant research restriction.

This study emphasizes the need for further investigation into the rates of lower limb revascularization procedures performed during the pandemic and their relationship to the rates of amputation.

CONCLUSION:

According to this study, there were more amputations overall and more major amputations during the pandemic than there had been before. A growing number of amputations in the pandemic group were due to tissue loss as a result of arterial insufficiency, suggesting that

revascularization operation disruption was probably a factor in this rise in amputations. During the post-pandemic phase, these data can be utilised for resource allocation and triage choices related to vascular surgery services. Furthermore, our study shows that when routine healthcare delivery is disrupted by global crises, patients with chronic illnesses like peripheral vascular disease frequently suffer disproportionately. This necessitates the development of improved methods that can be applied in similar crisis scenarios in the future.

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